DANIELE ORITI

I. PERSONAL DETAILS

- Date and place of birth: 10 / 01 / 1976 - Messina (Italy)
- Marital status: not married; Life partner: Sandra Tranquilli;
- Citizenship: Italian
- Postal address: Girton College - Wolfson Court, Clarkson Road, Cambridge, CB3 0HD, UK
- Telephone number: (00)(44)(01223)337024 (office)
- E-mail addresses: D.Oriti@damtp.cam.ac.uk, do216@cam.ac.uk, daniele.oriti@gmail.com

II. PROFILE

Theoretical Physicist, working in Quantum Gravity, with wide interests in fundamental General Relativity, String Theory, quantum black holes and quantum cosmology, philosophy of science and foundations of physical theories

III. EDUCATION

- 1989-1994 - Liceo Classico "Orazio" - Rome - "Diploma di maturita' classica", obtained in June 1994 - notation 60/60 (full marks);
- 1994-1999 - University of Rome "La Sapienza" - "Diploma di Laurea" in Physics, obtained in June 1999 with final mark 110/110 cum laude (first class honours degree). Thesis on "Quantization of the spinor field in Rindler spacetime and analysis of the Unruh effect" , advisors: Prof. Vladimir Belinski and Prof. Remo Ruffini; Subjects studied: theoretical astrophysics, general relativity, quantum field theory, quantum fields in curved spacetimes, statistical mechanics.
- 2000-2003 - PhD student at the Department of Applied Mathematics and Theoretical Physics, Centre for Mathematical Sciences, University of Cambridge, UK; subject: non-perturbative quantum gravity, spin foam models; supervisor: Dr. Ruth Williams. PhD Dissertation on "Spin Foam Models of Quantum Spacetime", defended in August 2003; degree obtained in October 2003.

IV. PROFESSIONAL EMPLOYMENT

- 2003 - 2006 - Post-Doctoral Research Fellow at the Department of Applied Mathematics and Theoretical Physics, Centre for Mathematical Sciences, University of Cambridge, and Girton College, University of Cambridge;
- 2006 (to start in October) - Post-doctoral researcher at the Institute for Theoretical Physics, Utrecht University, Netherlands.

V. PROFESSIONAL EXPERIENCE

- 1999 - editing coordinator of the Proceedings of the 2nd ICRA Network Workshop on "The chaotic universe", Rome-Pescara, February 1999;
- 1999 - member of the local organizing committee of the 3rd ICRA Network Workshop, on "Electrodynamics and magnetohydrodynamics around black holes", Rome-Pescara, July 1999;
- 2000 - scientific research collaborator to the International Center for Relativistic Astrophysics (ICRA) - University of Rome "La Sapienza";

- visiting scientist at CERN - Theory Division - Geneve - Switzerland - July 2000;
- visiting scientist at the California Institute of Technology - High Energy Physics department - Pasadena - California - USA, November 2000 and February 2001;
- visiting scientist at the Perimeter Institute for Theoretical Physics, Waterloo, Canada, October-November 2002, October 2003, October 2004, March 2006;
- visiting scientist at the Centre de Physique Theorique, Luminy, France, November 2001, April 2005, March 2006
- visiting scientist at the Institute for Theoretical Physics, Utrecht University, Utrecht, Netherlands, February 2006;
- visiting scientist at the International School for Advanced Studies (SISSA), Trieste, Italy, April 2006;
- 2001-present - reviewer for the journal "Mathematical Reviews", American Mathematical Society; reviews written up to date: 47;
- 2001-present - referee for the journals "Classical and Quantum Gravity", "Journal of Physics A", "Physical Review Letters", "Physical Review D", "Nuovo Cimento B".

VI. SCHOLARSHIPS, PRIZES AND GRANTS

- 2000-2002 - EPSRC research studentship;
- 2000-2002 - Isaac Newton Trust (Cambridge) research studentship in Mathematics;
- 2000-2002 - Girton College (Cambridge) research scholarship;
- 2000-2001 - Rouse Ball Travelling studentship in Mathematics, awarded by Trinity College, Cambridge;
- 2000 - awarded the "Antonio Stanghellini" prize for the best graduate in Theoretical Physics, by the Italian Physical Society (SIF).
- 2001 - awarded a distinction (third group) in the Smith-Rayleigh-Knight Prize competition for essays in Mathematics, by the University of Cambridge, with the essay: "Spacetime geometry from algebra: spin foam models for non-perturbative quantum gravity"
- 2002-2003 - Cambridge European Trust Reseach Studentship;
- 2002-2003 - C. T. Taylor Fund Research Studentship;
- 2003 - Cambridge Philosophical Society Research Studentship;
- 2005 - awarded the "Votruba Prize" for the best doctoral thesis in Theoretical Physics, by the Doppler Institute, Prague, Czech Republic, and the Foundation for Support of Theoretical Physics;

VII. ADMINISTRATIVE EXPERIENCE

- 2003-2006 - Member of the Governing Body of Girton College, University of Cambridge.

VIII. TEACHING AND OUTREACH EXPERIENCE

- 1998-1999 - private teaching activity to undergraduate students in Rome;
- 2000-2006 - teaching activity (supervisions) to undergraduate students at the University of Cambridge; subjects taught: classical dynamics, differential equations, special relativity, general relativity, foundations of quantum mechanics; one or two subjects taught per year, for a total of around 40 hours per year;
- 2003-2006 - Teacher for the course "Philosophy of Mathematics" for the Cambridge College Programme, summer school for high school students, July-August (course consists of 10 lectures for a total of 15 hours);

- 2004-2006 - Teacher for the course "Quantum Gravity: the search for understanding the nature of Space and Time" for the Cambridge College Programme, summer school for high school students, July-August (course consists of 10 lectures for a total of 15 hours);
- research internship supervised: Ahmed Youssef, Ecole Normale Superieure, Cachan, France, at D.A.M.T.P. from April 2006 to August 2006;
- PhD thesis supervised: James P. Ryan, "Matter fields in the group field theory approach to quantum gravity", University of Cambridge (expected 2006); Jimmy will be a postdoctoral research fellow at the Perimeter Institute of Theoretical Physics starting in November 2006;
- guest lecturer on 'Spin Foams and Group Field Theories'(three lectures for a total of 5.5 hours) for the undergraduate course 'Introduction to Quantum Gravity', held by Prof. Lee Smolin, at the Perimeter Institute for Theoretical Physics, Canada, March 2006 (available in streaming video at: http://streamer.perimeterinstitute.ca:81/mediasite/viewer/FrontEnd/Front.aspx);
- invited speaker at the 'Festival della Letteratura'(Literature Festival), Mantova, Italy, September 2006, on "Science and images of a quantum spacetime", public lecture and debate.

IX. CONFERENCES AND SCHOOLS

- 1998 - 1st ICRA Network Workshop on "The Lense-Thirring effect", Rome-Pescara, Italy, June;
- 1999 - 2nd ICRA Network Workshop on "The chaotic universe", Rome-Pescara, Italy, February;
- 1999 - 3rd ICRA Network Workshop, on "Electrodynamics and magnetohydrodynamics around black holes", Rome-Pescara, Italy, July; talk given;
- 2000 - 9th Marcel Grossman Meeting on "Recent developments in theoretical and experimental general relativity, gravitation and relativistic field theories", Rome, Italy, July; talk given;
- 2001 - 3rd Workshop on canonical and quantum gravity, Warsaw, Poland, June;
- 2001 - 25th J. Hopkins Workshop on current problems in particle theory: "A relativistic spacetime odissey", Florence, Italy, September;
- 2002 - School on "Aspects of Quantum Gravity: From Theory to Experimental Search", Bonn, Germany, February;
- 2002 - XV SIGRAV conference on General Relativity and gravitational physics, Monteporzio Catone, Rome, Italy, September; talk given;
- 2003 - Workshop on "Physics and Geometry of 3-dimensional Quantum Gravity", International Centre for Mathematical Sciences, Edinburgh, July; talk given;
- 2004 - Conference on "Quantum theory without observers", ZIF University of Bielefeld, Germany, February;
- 2004 - 40th Winter School on Theoretical Physics "Quantum Gravity Phenomenology", Ladek Zdroj, Poland, February.
- 2004 - Conference on "Non-Perturbative Quantum Gravity: Loops and Spin Foams", CIRM, Marseille, France, May;
- 2004 - 2nd DICE Workshop on "From Decoherence and Emergent Classicality to Emergent Quantum Mechanics", Piombino, Italy, September; talk given;
- 2004 - Isham60 Conference: "Current themes in Quantum Gravity", London, England, September;
- 2004 - Workshop "Quantum Gravity in the Americas: Status and future directions", Waterloo, Canada, October; talk given;
- 2005 - Workshop "Mathematical and Physical Aspects of Quantum Gravity", Blaubeuren, Germany, July; invited talk given;

- 2005 - 4th Meeting on "Constrained Dynamics and Quantum Gravity", Cala Gonone, Italy, September; talk given;
- 2005 - "Global Mathematical Relativity"programme, Isaac Newton Institute, Cambridge, UK, September-December;
- 2005 - "Loops '05"Conference, Potsdam, Germany, October; talk given.
- 2006 - 3rd DICE Workshop on "Quantum Mechanics between Decoherence and Determinism: new aspects from particle physics to cosmology", Piombino, Italy, September; invited talk given.

X. TALKS AND SEMINARS GIVEN

1. "The spinor field in Rindler space and an analysis of the Unruh effect", talk given at the 3rd ICRA Network Workshop, on "Electrodynamics and magnetohydrodynamics around black holes", Rome-Pescara, Italy, July 1999;
2. "Spin foam models for Quantum Gravity", seminar given at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, November 2000;
3. "The spinor field in Rindler spacetime and the Unruh effect", talk given at the 9th Marcel Grossman Meeting on "Recent developments in theoretical and experimental general relativity, gravitation and relativistic field theories", Rome, Italy, July 2000;
4. "The Barrett-Crane spin foam model for quantum gravity: a lattice gauge theory derivation", seminar given at the Physics Department, University of Rome "La Sapienza", December 2000;
5. "Quantum Gravity from algebra: the Barrett-Crane spin foam model and its classical actions", seminar given at the Physics Department, University of Rome "La Sapienza", April 2001;
6. "Causality in spin foam models of non-perturbative quantum gravity", talk given at the XV SIGRAV conference on General Relativity and gravitational physics, Monteporzio Catone, Rome, Italy, September 2002;
7. "Orientation dependent spin foam models" talk given at the Workshop on "Physics and Geometry of 3-dimensional Quantum Gravity", International Centre for Mathematical Sciences, Edinburgh, July 2003;
8. "The Feynman propagator for spin foam quantum gravity", talk given at the 2nd DICE Workshop on "From Decoherence and Emergent Classicality to Emergent Quantum Mechanics", Piombino, Italy, September 2004;
9. "The Feynman propagator for quantum gravity: spin foams, orientation, proper time and causality", talk given at the Workshop "Quantum Gravity in the Americas: Status and future directions", Waterloo, Canada, October 2004;
10. "Quantum Spacetime as a spin foam: discreteness, algebra and causality", seminar given at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, March 2005;
11. "Causal transition amplitudes in spin foam quantum gravity", talk given at the Centre de Physique Theorique, Marseille, France, April 2005;
12. "Quantum Spacetime as a spin foam: discreteness, algebra and causality", invited seminar given at the Physics Department, University of Southampton, May 2005;
13. "Quantum Gravity as a quantum field theory of simplicial geometry", invited talk given at the Workshop on "Mathematical and Physical Aspects of Quantum Gravity", Blaubeuren, Germany, July 2005;
14. "The group field theory approach to quantum gravity", talk given at the 4th Meeting on "Constrained Dynamics and Quantum Gravity", Cala Gonone, Italy, September 2005;
15. "Parametrised group field theories and quantum gravity transition amplitudes", talk given at the "Loops '05"Conference, Potsdam, Germany, October 2005;
16. "Spin foam models and the group field theory formulation of Quantum Gravity", invited seminar given at the Doppler Institute for Theoretical Physics, Prague, Czech Republic, January 2006;

17. "Group Field Theories for Quantum Gravity: What? Why?, invited talk at the Institute for Theoretical Physics, Department of Physics and Astronomy, Utrecht University, Utrecht, Netherlands, February 2006;

18. "A generalised formalism for group field theories: quantum gravity transition amplitudes and causality at the Planck scale", talk at the Centre de Physique Theorique, Luminy, France, March 2006, and at the Perimeter Institute, Waterloo, Canada, March 2006;

19. "Toward quantum gravity: spin foam models and group field theories", invited talk at the International School for Advanced Studies (SISSA), Trieste, Italy, April 2006.

20. "A quantum field theory picture of simplicial geometry and the emergence of spacetime", invited talk to be given at the 3rd DICE Workshop on "Quantum Mechanics between Decoherence and Determinism: new aspects from particle physics to cosmology", Piombino, Italy, September 2006.

XI. LANGUAGES

- Fluent in written and spoken English
- good understanding of written and spoken French and Spanish
- basic speaking skills in French
- 1996 - Course attended in English language in London
- 1999 - IELTS certificate obtained with overall band score 7.5.
- 2004-2005 - French course (basic level) attended at the Language Centre (University of Cambridge); certificate obtained with overall band score of 79/100.

XII. COMPUTER SKILLS

Use of Microsoft Windows operating system and related software, use of the algebraic manipulators Maple V and Mathematica, use of Tex and Latex , basic notions of UNIX.

XIII. PUBLICATIONS

The preprint numbers refer to the e-print archive at http://uk.arxiv.org/abs/

A. Papers in journals and collective books - refereed

1. D. Oriti, R. M. Williams, "Gluing 4-simplices: a derivation of the Barrett-Crane spin foam model for Euclidean quantum gravity", Phys. Rev. D 63, 024022 (2001); gr-qc/0010031;

2. E. R. Livine, D. Oriti, "Barrett-Crane spin foam model from generalized BF-type action for gravity", Phys. Rev. D65, 044025 (2002); gr-qc/0104043

3. D. Oriti, "Spacetime geometry from algebra: spin foam models for non-perturbative quantum gravity", Rep. Prog. Phys. 64, 1489 (2001), gr-qc/0106091;

4. D. Oriti, "Boundary terms in the Barrett-Crane spin foam model and consistent gluing", Phys. Lett. B, 532, 363 (2002); gr-qc/0201077;

5. D. Oriti, H. Pfeiffer, "A spin foam model for pure gauge theory coupled to quantum gravity", Phys. Rev. D66, 124010 (2002); gr-qc/0207041;

6. E. R. Livine, D. Oriti, "Implementing causality in the spin foam quantum geometry", Nucl. Phys. B663, 231 (2003), gr-qc/0210064;

7. "Manifold" entry for the "Concise Encyclopaedia of Supersymmetry and Non-Commutative structures in Mathematics and Physics", Eds. J. Bagger, S. Duplij, W. Siegel, Kluwer Academic Publishers, Dordrecht (2004);

8. E. R. Livine, D. Oriti, "About Lorentz invariance in a discrete quantum setting", JHEP 0406, 050 (2004), gr-qc/0405085;

9. D. Oriti, C. Rovelli, S. Speziale, "Spinfoam 2d Quantum Gravity and discrete bundles", Class. Quant. Grav. 22, 85 (2005), gr-qc/0406063;

10. F. Girelli, E. R. Livine, D. Oriti, "Deformed Special Relativity as an effective flat limit of quantum gravity", Nucl. Phys. B 708, 411 (2005), gr-qc/0406100;

11. D. Oriti, "The Feynman propagator for spin foam quantum gravity", Phys. Rev. Lett. 94, 111301 (2005), gr-qc/0410134;

12. L. Freidel, D. Oriti, J. Ryan, "A group field theory for 3d quantum gravity coupled to a scalar field", submitted for publication, gr-qc/0506067;

13. E. R. Livine, D. Oriti, "Coherents states in 3d Deformed Special Relativity: semiclassical points in a flat quantum spacetime", JHEP, 11050 (2005), hep-th/0509192;

14. E. R. Livine, D. Oriti, "Coupling of spacetime atoms and spin foam renormalisation from group field theory", to appear in Class. Quant. Grav., gr-qc/0512002;

15. D. Oriti, "Generalised group field theory and quantum gravity transition amplitudes", Phys. Rev. D 76, 061502 (2006), gr-qc/0512069;

16. D. Oriti, "Quantum Gravity as a quantum field theory of simplicial geometry", in B. Fauser, J. Tolksdorf, E. Zleider (editors), "Mathematical and Physical Aspects of Quantum Gravity", Birkhaeuser, Basel (2006), gr-qc/0512103;

17. D. Oriti, J. Ryan, "Group field theory formulation of 3d quantum gravity coupled to matter fields", submitted for publication, gr-qc/0602010;

18. D. Oriti, "The group field theory approach to Quantum Gravity", to appear in: D. Oriti (editor), "Approaches to Quantum Gravity", Cambridge University Press, Cambridge (2006);

19. D. Oriti, T. Tlas, "Causality and matter propagation in 3d quantum gravity", in preparation;

20. M. Karadi, E. Livine, D. Oriti, J. Ryan, "Non-commutative field theory description of generic matter fields from 3d quantum gravity";

21. F. Girelli, E. Livine, D. Oriti, C. Rovelli, "Deformed Special Relativity from physical axioms", in preparation;

22. D. Oriti, J. Ryan, "The non-commutative field theory limit for matter fields coupled to 3d quantum gravity: the GFT perspective", in preparation;

23. D. Oriti, J. Ryan, A. Youssef, "Hamiltonian analysis of group field theories and a Fock structure for quantum gravity", in preparation;

24. R. Oeckl, D. Oriti, J. Ryan, "A unified group field theory formulation of quantum gravity and gauge theory", in preparation;

25. D. Oriti, "Group field theory and simplicial gravity", in preparation;

26. D. Oriti, "Gravitons from non-perturbative quantum gravity in the group field theory approach", in preparation;

27. E. R. Livine, D. Oriti, "Absence of closed timelike loops in 3d group field theory for gravity coupled to matter fields", in preparation.

B. Conference Papers - refereed

1. D. Oriti, "The spinor field in Rindler spacetime: an analysis of the Unruh effect" in the proceedings of the 3rd ICRA Network Workshop, on "Electrodynamics and magnetohydrodynamics around black holes", Nuovo Cim. B 115, 1005 (2000); gr-qc/9912082

2. D. Oriti, "The Spinor Field in Rindler Spacetime and the Unruh Effect", Proceedings of the 9th Marcel Grossman Meeting "Recent developments in General Relativity and Gravitational Physics", Rome (2000);

3. E. R. Livine, D. Oriti, "Causality in spin foam models for quantum gravity", to appear in the Proceedings of the XV SIGRAV Conference on general relativity and gravitational physics (2003); gr-qc/0302018;

4. D. Oriti, "The Feynman propagator for quantum gravity: spin foams, proper time, orientation, causality and timeless ordering", in the Proceedings of the DICE 2004 Workshop, Piombino, Italy, Braz. J. Phys. 35, 481 (2005), gr-qc/0412043;

5. D. Oriti, "Quantum gravity as a group field theory: a sketch", in the Proceedings of the 4th Meeting on "Constrained Dynamics and Quantum Gravity", Cala Gonone, Italy (2005), Journal of Physics: Conference series, gr-qc/0512048;

6. D. Oriti, "A quantum field theory picture of simplicial geometry and the emergence of spacetime", in the Proceedings of the DICE 2006 workshop, Piombino, Italy, Journal of Physics: Conference series.

C. Books

- D. Oriti, editor, "Approaches to Quantum Gravity - Toward a new understanding of space and time", Cambridge University Press, 2006 (scheduled).

D. Popular articles

- "Gravita' Quantistica"(Quantum gravity) and "Teorie fisiche unificate"(Unified Physical Theories) entries for the enciclopaedia: "Novecento - Scienza e Tecnologia", Casa Editrice Motta, 2006 (in italian).

E. Unpublished material

1. D. Oriti, "Boundary conditions for the spinor field in Rindler spacetime and the quantum field theoretical basis of the Unruh effect"; gr-qc/0005010;
2. D. Oriti, R. M. Williams, "Evaluation of the Turaev-Viro invariant for different topologies", unpublished notes (2000);
3. D. Oriti, R. M. Williams, "Perturbations of the Turaev-Viro model for quantum gravity", unpublished notes (2001);
4. D. Oriti, "The pregeometry of spin foams", short essay submitted for the "Science and ultimate reality" competition for young scientists, organized by the Templeton Foundation, unpublished (2002).
5. D. Oriti, "Spin Foam Models of Quantum Spacetime", PhD Thesis, University of Cambridge (2003), 337 pages, gr-qc/0311066;
6. D. Oriti, "Generalised group field theories for 4-dimensional Quantum Gravity", unpublished notes (2003).

XIV. MEMBERSHIPS

- 1995 - present - member of the W. W. F. - Italy;
- 2000 - present - fellow of the Cambridge Philosophical Society;
- 2001 - present - member of the Cambridge European Society;
- 2003 - present - Who's Who listing in Science and Engineering

XV. OTHER ACTIVITIES

- 1995-1997 - Collaborator and contributor for the university student magazine "La Nottola di Minerva" at the Faculty of Literature and Philosophy, University of Rome "La Sapienza";
- 2002 - Volunteer work for the Tai Monkey Project, Tai National Park, Cote d'Ivoire, July 11th - August 8th;
- 2004 - 2005 - visitor of the Kalahari Meerkat Project, Kalahari desert, South Africa.

XVI. HOBBIES AND INTERESTS

- reading: everything;
- sports: football and tennis;
- listening music: from rock to ethnic and world music, from jazz to classical music;
- travelling (both for work and personal pleasure);
- main interests:
  - philosophy, in particular philosophy of science and epistemology, but also eastern philosophies and religions;
  - literature;
  - global problems, such as enviromental and substainable development related issues, biodiversity conservation, fair trade and ethical consumption;
  - ethology and animal behaviour, cognition and communication, primatology.